

APPARATUS AND METHOD FOR CONTROLLING KINETIC RATES FOR INTERNAL REFORMING OF FUEL IN SOLID OXIDE FUEL CELLS

Abstract

The present invention provides a solid oxide fuel cell in which kinetic rates for internal reforming are controlled. The solid oxide fuel cell comprises a cathode, an electrolyte layer adjacent to the cathode, and an anode adjacent to the electrolyte layer. The anode used in the cell of the invention includes a support structure which defines at least a portion of an anode flow channel and a catalyst that promotes reforming. The anode flow channel has an anode flow channel entrance for the introduction of fuel to the solid oxide fuel cell and an anode flow channel exit for removing unreacted fuel and/or by-products. The catalyst is dispersed within or upon the support structure such that the rate of reforming increases at increasing distances from the anode flow channel entrance. The present invention also provides a method of controlling internal reforming kinetic rates in a solid oxide fuel cell.